

AMENDMENTS TO THE CLAIMS

Claims 1-16 (Cancelled)

Claim 17 (Currently Amended) A refrigerating storage cabinet ~~for refrigerating an inner atmosphere and including comprising:~~

a refrigeration unit ~~for refrigerating an inner atmosphere, the refrigeration unit~~ having a compressor and an evaporator, the compressor including a plurality of performance levels; ~~the refrigerating storage cabinet comprising:~~

a storing unit configured to store a cooling characteristic including a target physical amount as a function of operating time, ~~the target physical amount decreasing gradually with lapse of operating time according to the cooling characteristic;~~

a physical amount sensor configured to detect a current physical amount at predetermined intervals of operating time; and

an operation control unit configured to control the compressor by selecting one of the plurality of performance levels based upon a relationship between the current physical amount and the target physical amount ~~for one of the predetermined intervals of corresponding to current operating time.~~

Claim 18 (Currently Amended) The refrigerating storage cabinet ~~of according to~~ claim 17, wherein:

the physical amount sensor is configured to detect a current temperature of the inner atmosphere ~~as the current physical amount;~~

~~the cooling characteristic includes a target temperature as the target physical amount is a temperature; the cooling characteristic is and a pull down characteristic and the physical amount is in for a temperature range from above a predetermined high temperature to near a set temperature; and~~

the predetermined high temperature is set to be higher than the set temperature by more a value larger than a predetermined value.

Claim 19 (Currently Amended) The refrigerating storage cabinet of according to claim 18,
wherein further comprising:

the cooling characteristic includes an upper limit temperature that is higher by the predetermined value than the set temperature; a lower limit temperature that is lower by the predetermined value than the set temperature; and a control-cooling characteristic for a control-cooling zone between and including the upper limit temperature and the lower limit temperature;
~~— wherein the operation control unit controls the compressor according to the control-cooling characteristic when the current physical amount is in the control-cooling zone; from the upper limit temperature to the lower limit temperature, the cooling characteristic is a control-cooling characteristic~~

wherein when the current physical amount reaches the lower limit temperature from a temperature higher than the lower limit temperature, the compressor is not operated turned off by the operation control unit; and

wherein when the current physical amount reaches the upper limit temperature from a temperature lower than the upper limit temperature, the compressor is operationally controlled by the operation control unit.

Claim 20 (Currently Amended) The refrigerating storage cabinet according to claim 19, wherein the compressor is a speed-controllable inverter compressor, and the operation control unit comprises:

 a physical amount change computing section configured to compute a current physical amount reduction degree at the predetermined intervals of operating time;

 a target physical amount reduction degree output section configured to provide a target physical amount reduction degree corresponding to the predetermined intervals of current operating time;

 a comparing section configured to compare the current physical amount reduction degree to the target physical amount reduction degree ~~at one of the predetermined intervals of~~

corresponding to current operating time; and

a speed control section configured to control the inverter compressor so that a rotational speed of the inverter compressor is increased when the comparing section indicates that the current physical amount reduction degree is smaller than the target physical amount reduction degree and ~~decreasing~~ the rotational speed of the inverter compressor is decreased when the comparing section indicates that the ~~actual~~ current physical amount reduction degree is larger than the target physical amount reduction degree.

Claim 21 (Previously Presented) The refrigerating storage cabinet according to claim 20, wherein the pull down characteristic is a linear function; and

wherein the target physical amount reduction degree is a constant value.

Claim 22 (Previously Presented) The refrigerating storage cabinet according to claim 21, wherein the control-cooling characteristic is a linear function.

Claim 23 (Previously Presented) The refrigerating storage cabinet of claim 20, wherein the control-cooling characteristic is a linear function.

Claim 24 (Previously Presented) The refrigerating storage cabinet of claim 20, wherein the control-cooling characteristic is a quadratic function; and

wherein the pull down characteristic is a quadratic function.

Claim 25 (Currently Amended) The refrigerating storage cabinet of claim 20, wherein the control-cooling characteristic is ~~represented as~~ an exponential function; and

wherein the pull down characteristic is an exponential function.

Claim 26 (Currently Amended) The refrigerating storage cabinet of claim 20, further comprising:

a reference table having a plurality of target amount reduction degrees associated with a plurality of target physical amounts, in which each target amount reduction degree has been determined from each of the for a plurality of target physical amounts according to the cooling characteristic and stored in the reference table according to an associated target physical amount;

wherein the target physical amount reduction degree output section retrieves provides the a target physical amount reduction degree associated with a target physical amount corresponding to current operating time by retrieving an appropriate target physical amount reduction degree from the reference table based on a correspondence between the physical amount and the associated target physical amount;

wherein the a-physical amount change computing section configured to compute a determines the current physical amount reduction degree for the physical amount based on the current physical amount and a previously measured physical amount; and

wherein the current physical amount reduction degree and the appropriate retrieved target physical amount reduction degree are used as inputs for the comparing section.

Claim 27 (Previously Presented) The refrigerating storage cabinet of claim 19, wherein the control-cooling characteristic is a quadratic function.

Claim 28 (Previously Presented) The refrigerating storage cabinet of claim 19, wherein the control-cooling characteristic is an exponential function.

Claim 29 (Currently Amended) The refrigerating storage cabinet of claim 20, wherein the control-cooling pull down characteristic includes a first pull down zone and a second pull down zone;

wherein the pull down characteristic includes a first pull down characteristic and a second pull down characteristic;

wherein the first pull down characteristic is used for the first pull down zone and is a linear function; and

wherein the second pull down characteristic is used for the second pull down zone part and is a quadratic function.

Claim 30 (Currently Amended) The refrigerating storage cabinet of claim 17, wherein said storing unit is configured to store a plurality of the cooling characteristics; and

wherein said operation control unit is configured to selects execute one of the cooling characteristics for execution based upon the current physical amount.

Claim 31 (Currently Amended) The refrigerating storage cabinet of claim 18, wherein said pull down characteristic is one of a plurality of the pull down characteristics is provided; and

wherein said operation control unit selects an appropriate one of the plurality of the pull down characteristics is executed for execution based on the current physical amount.

Claim 32 (Currently Amended) The refrigerating storage cabinet of claim 31, wherein the operation control unit selects the appropriate one of the plurality of the pull down characteristics for execution is executed based upon a zone of the physical amount that includes the current physical amount.

Claim 33 (Currently Amended) The refrigerating storage cabinet of claim 31, wherein; the operation control unit selects a first pull down characteristic from appropriate one of the plurality of the pull down characteristics includes a small temperature drop degree when a difference between the current physical amount and the set temperature target physical amount is less than a predetermined amount; and

the operation control unit selects a second pull down characteristic from wherein the appropriate one of the plurality of the pull down cooling characteristics includes a large temperature drop degree when the difference between the current physical amount and the set temperature target physical amount is greater than or equal to the predetermined amount;

the target temperature decreases with a first temperature degree drop and with lapse of operating time, according to the first pull down characteristic;

the target temperature decreases with a second temperature degree drop and with lapse of operating time, according to the second pull down characteristic; and

the first temperature degree drop is set to be smaller than the second temperature degree drop.

Claim 34 (Currently Amended) The refrigerating storage cabinet of claim 31, wherein the plurality of ~~the~~ pull down characteristics includes an auxiliary cooling characteristic having comprising a temperature curve that converges in which a convergence temperature remains at a temperature higher by an auxiliary predetermined value than the set ~~internal~~ temperature; and

wherein the operation control unit selects the auxiliary cooling characteristic from the plurality of pull down characteristics for execution ~~is selected as the appropriate one of the~~ plurality of the pull down characteristics when a difference between the current physical amount and an evaporation temperature of the evaporator is at or above a predetermined auxiliary temperature value or when the current physical amount is higher than the target physical amount corresponding to current operating time by the predetermined auxiliary temperature value.

Claim 35 (Currently Amended) A refrigerating storage cabinet ~~for refrigerating an inner atmosphere and including comprising:~~

~~a refrigeration unit for refrigerating an inner atmosphere, the refrigeration unit including a compressor and an evaporator, the compressor including a plurality of performance levels,~~
~~refrigerating storage cabinet comprising:~~

~~a storing unit configured to store a plurality of cooling characteristics including a target physical amount as a function of operating time, the target physical amount decreasing gradually with lapse of operating time according to the plurality of cooling characteristics;~~

~~a physical amount sensor configured to detect a current physical amount at predetermined intervals of operating time; and~~

~~an operation control unit configured to control the compressor by selecting one of the~~

plurality of performance levels based upon a relationship between the current physical amount and the target physical amount ~~for one of the predetermined intervals of corresponding to current operating time;~~

wherein the operation control unit is configured to select one of the plurality of cooling characteristics based upon the current physical amount; and

wherein the target physical amount corresponding to current operating time is determined from according to the selected one of the plurality of cooling characteristics.

Claim 36 (Currently Amended) The refrigerating storage cabinet of claim 35, wherein:

~~the physical amount sensor is configured to detect a current temperature of the inner atmosphere as the current physical amount;~~

~~the plurality of cooling characteristics include a target temperature as the target physical amount is a temperature; — the cooling characteristic is and a pull down characteristic while the physical amount is in for a temperature range from above a predetermined high temperature to near a set temperature; and~~

~~the predetermined high temperature is set to be higher than the set temperature by more a value larger than a predetermined value;~~

~~— said refrigerating storage cabinet further comprising:~~

~~the plurality of cooling characteristics include an upper limit temperature that is higher by the predetermined value than a the set temperature; the plurality of cooling characteristics include-, a lower limit temperature that is lower by the predetermined value than the set temperature; and a control-cooling characteristic for a control-cooling zone between and including the upper limit temperature and to the lower limit temperature;~~

~~wherein the operation control unit controls the compressor according to the control-cooling characteristic when the current physical amount is in the control-cooling zone, the cooling characteristic is a control cooling characteristic;~~

~~— wherein the control characteristic is control-cooling characteristic when the physical amount is in the control cooling zone from the upper limit temperature to the lower limit~~

~~temperature;~~

~~wherein~~ when the current physical amount reaches the lower limit temperature from a temperature higher than the lower limit temperature, the compressor is ~~not operated~~ turned off by the operation control unit; and

~~wherein~~ when the current physical amount reaches the upper limit temperature from a temperature lower than the upper limit temperature, the compressor is operationally controlled by the operation control unit.